NON-PUBLIC?: N
ACCESSION #: 8811180151
LICENSEE EVENT REPORT (LER)

FACILITY NAME: LaSalle County Station Unit 2 PAGE: 1 OF 5

DOCKET NUMBER: 05000374

TITLE: Manual Reactor Scram Following Loss of Reactor Recirculation Flow Due to Procedural Error
EVENT DATE: 10/14/88 LER #: 88-012-00 REPORT DATE: 11/14/88

OPERATING MODE: 1 POWER LEVEL: 039

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Richard J. Rohrer, Technical Staff Engineer, TELEPHONE: 815 357-6761 Extension 2251

COMPONENT FAILURE DESCRIPTION:
CAUSE: D SYSTEM: AD COMPONENT: MANUFACTURER:
REPORTABLE TO NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

At 1126 hours on October 14, 1988 the Unit 2 reactor was manually scrammed from 25% power following a trip of both Reactor Recirculation (RR) pumps from fast speed to off during the performance of an instrument surveillance. The surveillance tests the response time of the RR pump trip (EOC-RPT) system breaker arc suppression, by tripping the RR pump motor high speed breakers. This event was caused by a procedural error which unintentionally interrupted the logic for completing the downshift to low speed.

The manual scram was required by LaSalle Operating Procedures, which require a reactor scram whenever the actor is operating in natural circulation.

This event produced minimal impact to plant safety. Review of appropriate data following the scram confirmed that the reactor remained stable throughout the event. This was expected since the flow Control Line was approximately 63%. Instabilities are more likely when the reactor is operated at low core flows and relatively high (> 80%) Flow Control Lines.

As result of the scram the arc suppression response time test was suspended. This test will be completed during the refueling outage or during unit startup.

The procedure which caused this event will be revised to eliminate the error, along with its companion procedure for Unit 1.

This event is reported in accordance with the requirements of 10CFR50.73(a)(2)(iv) because an Engineered Safety Feature actuated.

END OF ABSTRACT

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor

Energy Industry Identification System (EIIS) codes are identified in the text as XX!.

A. CONDITION PRIOR TO EVENT

Unit(s): 2 Event Date: - 10/14/88 Event Time: 1126 hours

Reactor Mode(s): 1 Mode(s) Name: - Run Power Level(s) : 39%

B. DESCRIPTION OF EVENT

On October 14, 1988 the Unit 2 reactor was manually scrammed (RP) JC! from power following an unintentional trip of both Reactor Recirculation (RR) AD) pumps from fast speed to off. The scram occurred at 1126 hours during the scheduled performance of LaSalle Instrument Surveillance LIS-RR-205, "Unit 2 Recirculation Pump Trip System Arc Suppression Response Time Test." Initially, the reactor was in Operational Condition 1, Run, at approximately 39% power. Power had reduced to about 25% before the manual scram was initiated, due to the reduction in core flow accompanying the RR pump trip.

The intent of the test procedure for LIS-RR-205 was to trip both RR pumps off of the high speed power source and generate a signal to downshift the RR pumps to slow speed (445 RPM). A procedural error prevented the downshift sequence from completing for both RR pumps, and both pumps coasted to a stop.

The Operating Department personnel on duty realized that the surveillance held some potential for tripping one or both RR pumps off. They had

discussed the proper actions to take in these events and had the appropriate procedures open on the Nuclear Station Operator's (NSO, licensed Reactor Operator) desk prior to beginning the surveillance. The coastdown of the pumps from fast speed was monitored by the Unit 2 NSO. When the NSO realized that the RR pumps had coasted past 445 RPM, he notified the Shift Engineer (Senior Reactor Operator, SRO) who was present in the Control Room for this test. The Shift Engineer directed the NSO to arm the manual scram buttons and scram the reactor as soon as the RR pumps coasted to zero speed. Accordingly, the NSO manually scrammed the Unit 2 reactor as soon as the RR pumps reached zero speed.

The manual scram was required by LaSalle Operating Procedure LOA-RR-07, "Loss of Recirculation Flow - Both Loops," which requires a reactor scram whenever the reactor is operating in natural circulation. This requirement originates from Confirmatory Action Letter (CAL) CAL-RIII-88-03, which was issued by the Nuclear Regulatory Commission following an instance where a reactor experienced neutron flux oscillations while operating in natural circulation.

B. DESCRIPTION OF EVENT (Continued)

Normal scram recovery followed the manual scram, and the second refuel outage (which had been scheduled to start within the next 24 hours) commenced. Reactor low water level (NB) AD! (level 3) scram switches tripped 8 seconds after the scram due to level shrinkage, as expected, and one reactor high water level (level 8) High Pressure Core Spray (HP) BG! switch generated a high level alarm when water level approached its setpoint 2 minutes and 53 seconds after the scram. Other level 8 switches did not trip, because reactor water level never exceeded the setpoint of 55.5 inches Reactor Water Level.

The level 3 switches produced scram and isolation (PC) BF! signals, but all control rods were already fully inserted and the appropriate isolation valves were already closed, so no equipment actuated as a result of the level 3 trip.

C. APPARENT CAUSE OF EVENT

This event was caused by an inadequacy in procedure LIS-RR-205.

The circuit breakers which supply power to the RR pumps are shown schematically in Figure 1. In order to obtain an accurate response time for breaker arc suppression during a trip of the RR pumps, the secondary trips

of the fast speed "3" breakers (3A and 3B) are bypassed during the test. This forces the trips to occur due to actuation of the primary trip coils, and eliminates the possibility of the secondary trip coils producing redundant trips which could affect the measured response times. As a result of this concern, the automatic trips of the 3 breakers from the associated 4 breaker (open interlock) were bypassed by procedure.

An interlock prevents the initiation of the downshift logic for the "A" RR pump if the 3B breaker is closed. Since the interlock trip of the 3B breaker upon trip of the 4B breaker was bypassed as discussed above, the test procedure called for manually placing the 3B breaker into Pull-to-Lock after the 4B breaker tripped. However, the downshift initiation sequence does not function when the speed of the RR pumps is below 1700 RPM. The NSO placed the 3B breaker into Pull-to-Lock 3 seconds after the RR pumps tripped, and the speed of the "A" RR pumps had decreased to below 1700 RPM, so the required conditions for producing a downshift of the "A" RR pump were never all fulfilled at the same time. As a result, the "A" RR pump coasted to a stop.

The circuit to downshift the "B" RR pump functioned as designed and a signal to close the 2B breaker as soon as the pump coasted to slow speed was sealed in. However, placing the 3B breaker in Pull-to-Lock de-energized part of the permissive logic, which broke the seal-in and de-energized the downshift sequence relay. This removed the signal to Close the 2B breaker at slow speed, so the "B" RR pump coasted to a stop also.

D. SAFETY ANALYSIS OF EVENT

This event produced minimal impact to plant safety.

Review of the Sequence of Events Recorder data, the Alarm Typer printout, the Post-trip Log, Average Power Range Monitor (APRM) IG! recorder traces and the STARTREC transient recorder data following the scram confirmed that the reactor remained stable throughout the event. This was expected since the Flow Control Line was approximately 63% due to extended coastdown of the reactor. Instabilities are more likely when the reactor is operated at low core flows and relatively high (> 80%) Flow Control Lines.

The potential consequences of events like this one are limited because the surveillance which caused this event is performed only at low reactor power levels.

E. CORRECTIVE ACTIONS

As a result of the scram the arc suppression response time test had to be suspended after testing only one of two channels of the RR pump trip (EOC-RPT) system. The other channel will be tested during the refuel outage or during unit startup after refueling. The Instrument Surveillance Program will hold this surveillance item open until both channels are tested satisfactorily.

The procedure which precipitated this event (LIS-RR-205) will be revised, along with its companion procedure for Unit 1 (LIS-RR-105). This effort is being tracked by AIR 374-200-88-04401.

The personnel who review and approve procedure revisions will be familiarized with this event with emphasis on attention to detail during review of procedure revisions. This action will be tracked by AIR 374-200-88-04405.

The Technical Staff is investigating the possibility of testing the EOC-RPT in a more efficient sequence of pump trips to reduce the probability of two-pump trips. This action will be tracked by AIR 374-200-88-04403.

The need to scram the reactor upon loss of RR pumps has been evaluated and a new Technical Specification for stability (3/4.4.1.5) has been approved. This newly approved specification would not have required a reactor scram in this event. However, the Confirmatory Action Letter which mandated the scram had not been cleared at the time of the event, so the scram was initiated to meet the requirements of the CAL. The CAL has since been cleared. Station procedures will be revised appropriately following resolution of present stability concerns. AIR 374-200-88-04404 will track completion of these procedure revisions.

F. PREVIOUS EVENTS

None.

G. COMPONENT FAILURE DATA

None.

FIGURE OMITTED - NOT KEYABLE (DRAWING)

Commonwealth Edison
LaSalle County Nuclear Station

Rural Route #1, Box 220
Marseilles, Illinois 61341
Telephone 815/357-6761

November 14, 1988

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Station Pl-137
Washington, D.C. 20555

Dear Sir:

Licensee Event Report #88-012-00, Docket #050-374 is being submitted, to your office in accordance with 10CFR50.73(a)(2)(iv).

G. J. Diederich
Station Manager
LaSalle County Station

GJD/RJR/kg

Enclosure

xc: Nuclear Licensing Administrator
NRC Resident Inspector
NRC Region III Administrator
INPO - Records Center

END OF DOCUMENT

ACCESSION #: 8811180165